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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,705	11/04/2003	Katsuji Hattori	61352-044	9074

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EXAMINER	
SCHECHTER, ANDREW M	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 03/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,705	HATTORI ET AL.	
	Examiner	Art Unit	
	Andrew Schechter	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *40,41,43-45,47 and 48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *40,43,44,47 and 48* is/are allowed.

6)☒ Claim(s) *41 and 45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/786,160.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 20 December 2004 have been fully considered but they are not persuasive.

Regarding claim 45, the applicant argues [p. 8] that *den Boer* discloses a display electrode 3 with openings 35 and 38 which are outside the display pixels. This is not persuasive. Figs. 1 and 4 of *den Boer* clearly show at least opening 35 to be inside the display pixel.

Claim Objections

2. Claim 45 is objected to because of the following informalities: "openings" should be "an opening" since each display electrode and/or common electrode has only a single opening. Similarly, "display pixels" should be "a display pixel". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Wakemoto et al.,* Japanese Patent Document No. 10-020284 (provided by the applicant; the examiner previously attached a machine-translation) in view of *Mazaki et al.,* U.S. Patent No. 5,883,685 and further in view of *den Boer et al.,* U.S. Patent No. 5,641,974.

Wakemoto discloses a liquid crystal display device comprising a pair of substrates [1, 20], liquid crystal [14] subjected to parallel alignment; wherein, with no voltage the liquid crystal is in splay alignment, with pretilt angles at upper and lower boundaries having opposite signs; wherein, before driving, an initialization is performed to transition from splay to bend alignment by application of a voltage; wherein driving is performed in the bend alignment; comprising [see Fig. 4, for instance] at least one region [32] in the display pixels where the liquid crystal layer thickness is smaller than around it, and the strength of an electric field applied to the liquid crystal layer in this region is larger than the strength of an electric field applied to the liquid crystal layer around it [paragraph 0035, for instance].

Wakemoto does not appear to disclose the limitation that there is a phase compensator arranged on an outer side of the substrates. *Mazaki* does disclose [see abstract] an analogous OCB LCD device with a phase compensator arranged on an outer side of the substrates. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phase compensator of *Mazaki* in the device of *Wakemoto*, motivated by *Mazaki*'s teaching that it is "capable of effecting not only color

compensation by also the expansion of a viewing angle so far not attained" [col. 2, lines 39-45].

Wakemoto does not disclose the additional limitation that a portion of either the display or common electrode (or both) is provided with an opening in a region within a display pixel. *Den Boer* discloses [see Fig. 4, for instance] a display electrode provided with such an opening [at the contact hole between the pixel electrode and the TFT]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use this structure (flattening film [33] with contact hole) in the device of *Wakemoto*, motivated by having an increased aperture ratio (hence higher quality display) because the pixel electrodes can be formed to overlap the address lines via an insulating film [33], with electrical contact via the contact hole. Claim 45 is therefore unpatentable.

5. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Wakemoto et al.,* Japanese Patent Document No. 10-020284 (provided by the applicant; the examiner previously attached a machine-translation) in view of *Mazaki et al.,* U.S. Patent No. 5,883,685 and further in view of *Takeda et al.,* U.S. Patent No. 6,661,488.

Wakemoto discloses a liquid crystal display device comprising a pair of substrates [1, 20], liquid crystal [14] subjected to parallel alignment; wherein, with no voltage the liquid crystal is in splay alignment, with pretilt angles at upper and lower boundaries having opposite signs; wherein, before driving, an initialization is performed to transition from splay to bend alignment by application of a voltage; wherein driving is performed in the bend alignment; comprising [see Fig. 4, for instance] at least one

region [32] in the display pixels where the liquid crystal layer thickness is smaller than around it, and the strength of an electric field applied to the liquid crystal layer in this region is larger than the strength of an electric field applied to the liquid crystal layer around it [paragraph 0035, for instance].

Wakemoto does not appear to disclose the limitation that there is a phase compensator arranged on an outer side of the substrates. *Mazaki* does disclose [see abstract] an analogous OCB LCD device with a phase compensator arranged on an outer side of the substrates. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phase compensator of *Mazaki* in the device of *Wakemoto*, motivated by *Mazaki*'s teaching that it is "capable of effecting not only color compensation by also the expansion of a viewing angle so far not attained" [col. 2, lines 39-45].

Wakemoto also discloses an electric field concentration portion in the display pixels [32, as above], with a bump-shaped protrusion protruding in the thickness direction of the liquid crystal layer. However, as pointed out by the applicant, *Wakemoto* does not disclose that the transparent electrode is layered on top of the bump-shaped protrusion (instead the bump-shaped protrusion is on top of the electrode). The two structures are different, but result in the same surface profile.

Takeda discloses [see Fig. 10, for instance] a variety of structures with protrusions on top of electrodes, similar to *Wakemoto's* structure. *Takeda* then discloses [see Figs. 137 and 138, for instance] the same function can be accomplished with a structure in which the display electrode is formed on top of the protrusion.

Takeda teaches [col. 59, lines 55-64] that this is advantageous because a separate step of forming the protrusion can be avoided, by making the protrusion underneath the display electrode while performing other necessary steps. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to form a bump-shaped protrusion layered with a transparent electrode in the device of *Wakemoto*, motivated by this teaching of *Takeda* that doing so can avoid an increase in the number of steps. (Since the conductive surface profile in *Wakemoto* is unchanged, the functionality of the bump is maintained.) Claim 41 is therefore unpatentable.

Allowable Subject Matter

6. Claims 40, 43, 44, 47, and 48 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose an LCD with a voltage-driven splay-bend initialization transition as recited in claim 40, in particular the limitations that there is at least one region outside the display pixels where the liquid crystal layer thickness is smaller than inside the display pixels, and that an electric field caused by the application of said voltage, applied to the liquid crystal layer, is larger in this region than in the pixels. Claim 40 is therefore allowed, as are dependent claims 47 and 48.

The prior art does not disclose an LCD with a voltage-driven splay-bend initialization transition as recited in claims 43, in particular the limitation that the electric

field caused by the application of said voltage concentrates in at least one location outside the display pixels. Claim 43 is therefore allowed, as is dependent claim 44.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Andrew Schechter
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26 February 2005